

Claims

1) A capping unit for closing containers (2) with respective caps (3), of the type comprising: a carrier and conveyor component (5) on which to advance the containers (2) and the relative caps (3);  
5 a motor (6) associated with the carrier and conveyor component (5), by which the selfsame component (5) is set in rotation about a respective primary axis (5a); a plurality of capping assemblies (11) associated with the carrier component (5), each positioned above a corresponding container (2) and capable of movement vertically between a first position, distanced from the respective container (2), and a second position actively engaging the container, wherein each capping assembly (11) presents a gripping mechanism (17) such  
10 as can be associated with a relative cap (3) when the corresponding capping assembly (11) is in the second position, and the gripping mechanism (17) is rotatable in such a way as to screw the cap (3) onto a threaded neck (4) of the respective container (2)  
15 about a respective secondary axis (17a), characterized in that it further comprises first drive means (14) by which the single capping assemblies (11) can be set in motion vertically, one independently of another, and second drive means (18) by which the single gripping mechanisms (17) can be set in rotation one independently of another.  
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2) A unit as in claim 1, wherein the first drive means (14) comprise a plurality of primary electric motors (14a), each one of which associated with a respective capping assembly (11).

5 3) A unit as in claim 1, wherein the second drive means (18) comprise a plurality of secondary electric motors (18a), each one of which associated with a respective gripping mechanism (17).

10 4) A unit as in claims 2 and 3, further comprising an electronic controller device (40) connected to each of the primary electric motors (14a) and the secondary electric motors (18a).

15 5) A unit as in claim 4, wherein the electronic controller device (40) comprises a processing block (41) by means of which to vary the operating parameters of each primary electric motor (14a) and each secondary electric motor (18a) according to the dimensions of the respective containers (2).

20 6) A unit as in claims 2 and 3, wherein the carrier component (5) comprises:

- a drum (8) associated with the motor (6) and rotatable about the primary axis (5a);
- a base (9) associated with the bottom of the drum (8), on which to stand the containers (2);
- 25 - a platform (10), associated with the top of the drum (8) and facing the base (9), to which the

capping assemblies (11) are mounted in a circumferential formation.

7) A unit as in claim 6, wherein each capping assembly (11) comprises a rod (12) inserted slidably through a relative guide (13) afforded by the platform (10), extending longitudinally in coaxial alignment with the secondary axis (17a) and presenting a first end (12a) with which the respective gripping mechanism (17) is associated, and  
5 a second end (12b) opposite to the first end (12a).  
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8) A unit as in claim 7, wherein each primary electric motor (14a) occupies a position coinciding with the second end (12b) of the rod (12) and above the platform (10).

15 9) A unit as in claim 8, wherein each primary electric motor (14a) comprises a shaft (15) rotatable about a respective axis perpendicular to the secondary axis (17a), and a gear (15a) keyed to the shaft (15).

20 10) A unit as in claim 9, wherein each rod (12) presents a rack (16) extending longitudinally along the respective second end (12b) and engaged in meshing contact by the gear (15a) of each primary electric motor (14a), in such a way that the rod (12)  
25 can be set in motion vertically by rotation of the gear (15a).

11) A unit as in claims 7 to 10, wherein each secondary electric motor (18a) is mounted between the first end (12a) of the corresponding rod (12) and the gripping mechanism (17) and presents a shaft (19) rotatable about an axis parallel to the secondary axis (17a).  
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12) A unit as in claim 11, wherein the gripping mechanism (17) comprises:  
10 - a gripper (20) attached to the shaft (19) of the respective secondary electric motor (18a), capable of movement between an open condition in which the relative capping assembly (11) is in the first position and a closed condition in which the relative capping assembly (11) is in the second position with the gripper (20) engaging the relative cap (3);  
15 - an actuator (25) by which the gripper (20) is caused to alternate between the open and closed conditions;  
- a transmission component (31) interposed between  
20 the gripper (20) and the actuator (25), by which motion is relayed from the actuator (25) to the gripper (20).

13) A unit as in claim 12, wherein the gripper (20) comprises:  
25 - a carrier element (21) of substantially cylindrical appearance, associated coaxially with the shaft (19) of the secondary electric motor (18a);

- a plurality of jaws (22) hinged circumferentially to the cylindrical carrier element (21) and capable of movement between a position drawn toward one another, corresponding to the closed condition of the gripper (20), and a position spread apart from one another, corresponding to the open condition of the gripper (20).

14) A unit as in claim 13, wherein each jaw (22) presents a substantially curved appearance and is  
10 identifiable as having a first end (22a) furnished with a following roller (23), a second end (22b) opposite to the first end (22a), furnished with a contact element (24) designed to engage the cap (3), and an intermediate portion (22c) disposed between the first end (22a) and the second end (22b) and hinged to carrier element (21).

15) A unit as in claim 12, wherein each transmission component (31) comprises a plunger (32) of substantially frustoconical geometry coaxially encircling and slidable along the shaft (19) of the secondary electric motor (18a), and a mechanical linkage (33) coupled rigidly to the plunger (32).

16) A unit as in claim 15, wherein the plunger (32) presents a downwardly tapering outer surface (32c), and the following roller (23) of each jaw (22) rolls vertically on the selfsame external surface (32c).

17) A unit as in claim 15, wherein the actuator (25) is a linear actuator coupled to the mechanical linkage (33) in such a way as to induce a vertical movement of the plunger (32).